

What is claimed is:

1 1. An improved frequency standard of the type wherein a beam of circularly-
2 polarized light passes through an alkali vapor resonance cell,
3 the improved frequency standard being characterized in that:
4 the beam of circularly-polarized light is produced by passing a beam of
5 linearly-polarized light through a circular polarizer, the circular polarizer being
6 rotatable around an axis that is parallel to the beam of light,
7 whereby the intensity of the circularly-polarized beam is controlled by rotating the
8 circular polarizer.

1 2. The improved frequency standard set forth in claim 1 further characterized in that:
2 the beam of linearly-polarized light is produced by a laser.

1 3. The improved frequency standard set forth in claim 1 further characterized in that:
2
3 the beam of linearly-polarized light is produced by a linear polarizer.

1 4. The improved frequency standard set forth in claim 1 further characterized in that:
2
3 the circular polarizer includes a linear polarizer and a quarter wave retarder;
4 and
5 during rotation, the linear polarizer and the quarter wave retarder are oriented
6 to each other such that the conversion of light which reaches the quarter wave retarder
7 to circular polarization is maximized.

1 5. The improved frequency standard set forth in claim 4 further characterized in that:
2
3 the linear polarizer and the quarter wave retarder are oriented to each other
4 such that the axis of polarization of the linear polarizer is oriented at an angle of 45°
5 to the fast axis of the quarter wave retarder.

1 6. The improved frequency standard set forth in claim 1 wherein:
2 during rotation, the axis of polarization of the linear polarizer and the fast axis
3 of the quarter wave retarder have a fixed orientation to each other.

1 7. The improved frequency standard set forth in claim 6 wherein:
2 during rotation, the linear polarizer and the quarter wave retarder are
3 oriented to each other such that the conversion of light which reaches the quarter
4 wave retarder to circular polarization is maximized.
5

1 8. The improved frequency standard set forth in claim 7 wherein:
2 the axis of polarization of the linear polarizer and the fast axis of the quarter
3 wave retarder are oriented to each other at an angle of 45° .

1 9. The improved frequency standard set forth in claim 6 wherein:
2 the linear polarizer and quarter wave retarder are rotated as a unit.

1 10. A method employed in a frequency standard of the type wherein a beam of
2 circularly-polarized light passes through an alkali vapor resonance cell to control the
3 intensity of the beam of circularly-polarized light, the circularly-polarized light being
4 produced by passing a linearly polarized beam of light through a circular polarizer,
5 the circular polarizer being rotatable about an axis that is parallel to the beam of light,
6 and
7 the method comprising the steps of:
8 rotating the circular polarizer; and
9 determining the intensity of the beam,
10 the steps being repeated until a desired intensity has been obtained.

1 11. The method set forth in claim 10 further comprising the step of:
2 preventing further rotation of the circular polarizer after the desired intensity
3 has been obtained.

12. The method set forth in claim 10 wherein:

the beam of circularly polarized light strikes a device which measures the intensity of the beam; and

the steps of the method are automatically performed in response to changes in the
5 intensity of the beam as measured by the device.